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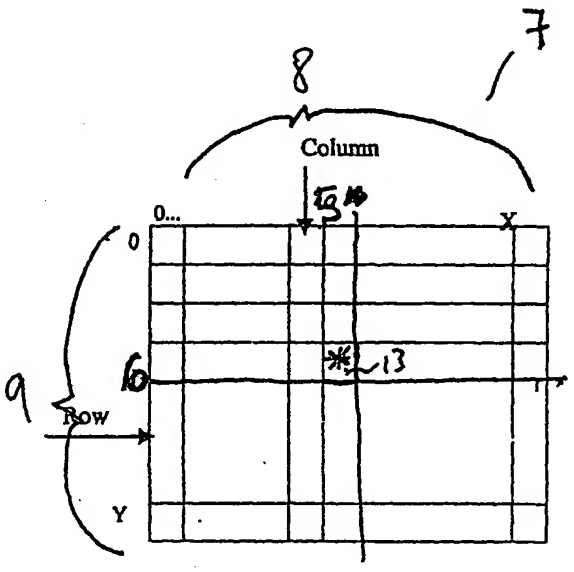
(54) Title: A MEMORY STRUCTURE



(57) Abstract: A memory structure (16) comprises a data storage array (7) and an addressing array (10). The addressing array (10) includes pointers to entries in the storage array (7) and the amount of information stored for the pointers is relatively small rendering the use of the memory more efficient.

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A MEMORY STRUCTURE

This invention relates to a memory structure for storing data in a computer system.

In current systems data is stored in a structure in accordance with a digit tree.

Each element or node of the tree contains ten pointers, one for each possible digit value. The pointers point to a node of the next level of the tree.

Where the pointer length has a length of four bytes it will be understood that forty bytes of storage will be taken up for the pointers of just one level.

According to the invention there is provided a memory configured into a memory structure being at least a two-dimensional array wherein each node of the structure contains a row pointer to a row and a column pointer to a column of the array.

By providing such a structure each node requires a three byte pointer to the row and one byte for each of the pointers to the columns. Thus for three columns there is a requirement of thirteen bytes per element. Thus the storage overhead is reduced to one third of that required for the digit tree.

A specific embodiment of the invention will now be described, by way of example only, with reference to the drawing in which

Figure 1 shows a computer system having a memory structured in accordance with the invention; and

Figures 2 to 4 are explanatory figures.

As in shown in figure 1, a computer system 1 includes a processor 2 linked by a data-bus and a control bus 3 to input devices 4, output devices 5 and a memory 6.

The input devices 4 can comprise a keyboard and a mouse or other input device.

The output devices 5 include a display and a printer.

The memory 6 is embodied as a memory board of a number of solid-state memory devices. It contains both Read Only Memory (ROM) and Random Access Memory (RAM).

Part of the memory 6 is structured to provide a database of records. The memory 6 is structured in accordance with the invention to provide the database as a two dimensional array of nodes.

The array 7 is depicted in figure 2 and comprises a number of columns 8 and rows 9. The columns are number 0 to X and the rows are numbered 0 to Y.

The structure comprises a number of locations in memory. For example, the *location is found in column 5 row 6.

In this example X and Y are 9 therefore there are ten rows and ten columns (0 to 9 in each case giving 10 entries).

To obtain access to the contents of the memory locations in the structure and addressing array 10 shown in figure 3 is provided. This comprises a row index 11 and associated column indices 12.

Figure 4 shows that the row index 11 is first accessed and the pointer in the fifth entry corresponding to the fifth row found. The pointer is followed to the

appropriate column indices for that row in 12 and the pointer to the destination 13 (6, 5) followed.

CLAIMS

1. A memory structure for use in a computer system for the storage of data which structure comprising a storage array and an addressing array for storage of pointers to locations in the storage array.

2. A memory structure as claimed in claim 1 wherein the storage array and the addressing arrays are two dimensional arrays.

3. A computer system including a memory structure as claimed in claims 1 or 2.

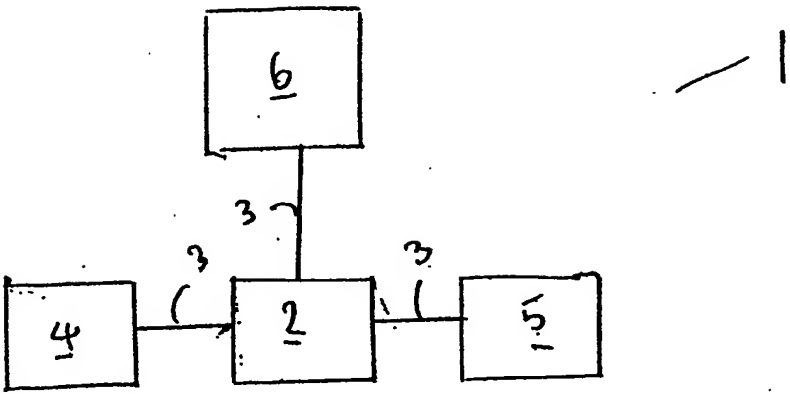

Figure 1

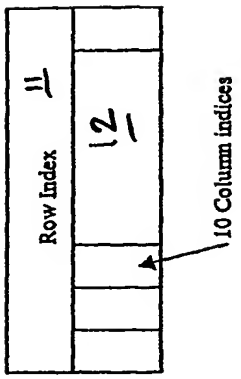

Figure 3.

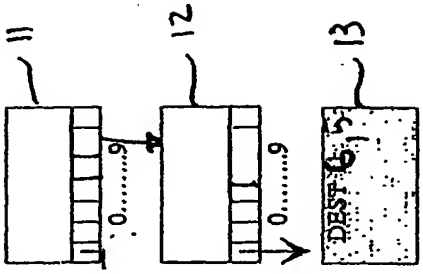

Figure 4

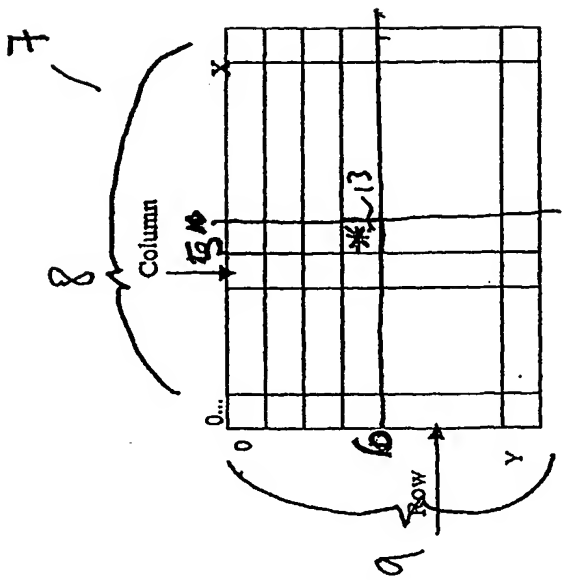

Figure 2

INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G06F17/30

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TED JENSEN: "A tutorial on pointers and arrays in C, version 1.2" INTERNET ARTICLE, 'Online! September 2003 (2003-09), pages 1-53, XP002347448 Retrieved from the Internet: URL:http://pweb.netcom.com/{tjensen/ptr/pointers.pdf> 'retrieved on 2005-09-27! page 38, line 10 - page 41, last line -/--	1-3

[X] Further documents are listed in the continuation of box C.

[ ] Patent family members are listed in annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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Date of the actual completion of the international search	Date of mailing of the international search report
30 September 2005	18/10/2005

Name and mailing address of the ISA	Authorized officer
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INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2005/007716

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DAN HIRSCHBERG: "Pointers and Memory Allocation" INTERNET ARTICLE, 'Online! 5 May 2003 (2003-05-05), pages 1-3, XP002347505 Irvine, CA, USA Retrieved from the Internet: URL:http://www.ics.uci.edu/{dan/class/165/notes/memory.html> 'retrieved on 2005-09-30! page 2, lines 1-27	1-3